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Supercomputer Institute 2021 Year-End Review

Evan Donato (HPC-DES)

September 14, 2021

Recruiting quality candidates into HPC is a challenge

- An ideal early career candidate for the HPC division is one who has a bachelor's degree in a related field and experience with concepts of high performance computing.
- Most programs do not provide a good background on the systems side of HPC in their undergraduate curricula.
- We are competing for the same candidates that large tech companies are interested in and recruiting into a field that isn't on the radar of many undergrads.

The Supercomputer Institute

- This year marked the 15th year of the Supercomputer Institute.
- The school was designed to address some of the difficulties in having an early career pipeline of candidates interested in HPC.
- The school starts with an intensive 3 week, full-time bootcamp.
- An 8 week team research project follows with mentorship from subject matter experts within the HPC division.
- Sophomores through post-baccs are primary targets and many students return for follow on internships and post-bacc appointments.

2021 Personnel

Leadership

Evan Donato (HPC-DES) 2021 PI
Francine Lapid (HPC-ENV) 2022 PI
Dave Morton (HPC-DES) RLM

Instructors

Travis Cotton (HPC-SYS)
Jeb Baxley (HPC-SYS)
Alden Stradling (HPC-SYS)
Devon Bautista (HPC-DES)
Tim Bargo (HPC-DES)

Student Liaison

Julie Wiens (HPC-DO)

Mentors

Reid Priedhorsky (HPC-ENV)
Jordan Ogas (HPC-ENV)
Paul Ferrell (HPC-ENV)
Megan Phinney (HPC-ENV)
Nicholas Sly (HPC-ENV)
Lowell Wofford (HPC-DES)
Travis Cotton (HPC-SYS)
Dominic Manno (HPC-SYS)
Jarrett Crews (HPC-SYS)
Christian Storer (HPC-ENV)
Connor Whitfield (HPC-SYS)
Marc Santoro (HPC-ENV)
Devon Bautista (HPC-DES)
Shane Goff (HPC-SYS)
Steve Poole (ALDSC)
Gary Grider (HPC-DO)
Kevin Bryant (US DOD)

Lecturers

Cory Lueninghoener (NIE-IS)
Mike Mason (HPC-ENV)
Brett Holman (HPC-SYS)
Mark Petersen (CCS-2)
Julie Wiens (HPC-DO)
Jarrett Crews (HPC-SYS)
Marcel Fallet (NSA)
Reid Priedhorsky (HPC-ENV)
Jordan Ogas (HPC-ENV)
Megan Phinney (HPC-ENV)
Lowell Wofford (HPC-DES)
Lissa Moore (CCS-3)
Teresa Ranadive (UMD)
Roger Wiens (ISR-2)
Thomas Rolinger (UMD)
Christopher Krieger (UMD)

Recruitment

- Recruitment
 - On-site recruitment at conferences and career fairs at colleges and universities.
 - Website and brochure as a secondary vehicle for information and recruiting.
- Candidate pool
 - 72 total applicants
 - Demographics
 - 29 female applicants, 6 female and non-binary participants
 - There were no foreign nationals in the participants and an unknown number in the applicants.

School Content and Progression



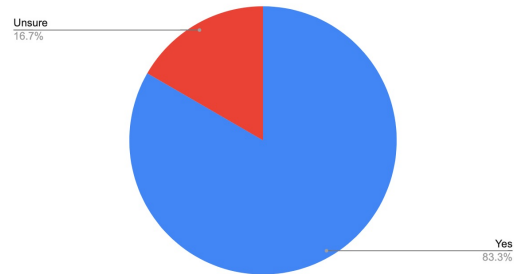
- Boot Camp
 - A 3 week, intensive session providing the students with hands-on training in networking, InfiniBand, storage and file systems, monitoring tools, schedulers, and cluster management techniques.
 - We reused a completely virtualized cluster environment that matched a physical cluster transparently for the purposes of the bootcamp.
- Lectures
 - 13 Lectures from LANL staff and guest lecturers from DOD, NSA, and University of Maryland covering many areas of HPC
- Projects
 - 6 projects, 17 mentors, team sizes from 2-6 participants

Preparation

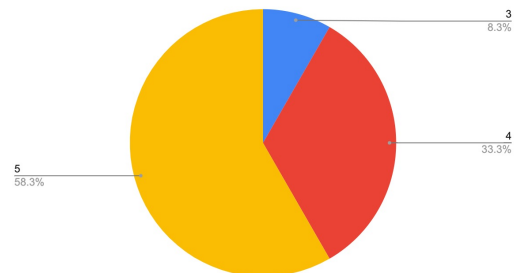
- Candidate Selection process
 - The committee consisted of 7 members from the different groups making up the HPC division
 - selection criteria based on GPA, Linux knowledge, CS and engineering coursework, and evidence of team work and communication skills
 - This year was an excellent year for candidates both in volume and quality
- Project/Mentor selection process
 - Projects proposals were solicited via email early in 2021
 - Our new need was to find projects that could be worked on remotely and potentially in smaller groups
- The Supercomputer Institute completed its 15th year in 2021

Student Feedback

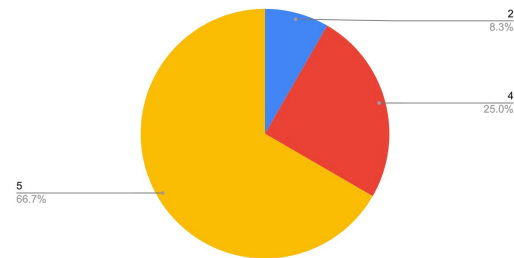
Would you be interested in coming back to LANL?



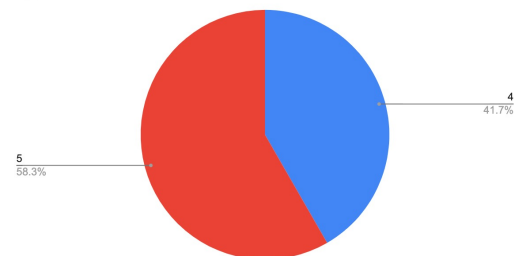
I engaged regularly with my mentor.



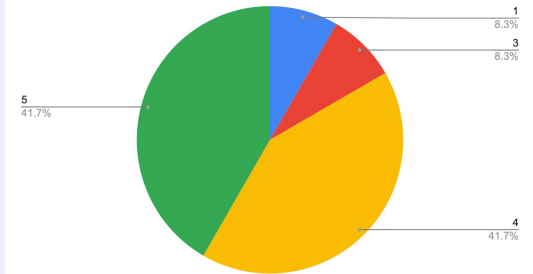
I worked on interesting and rewarding research during my internship.



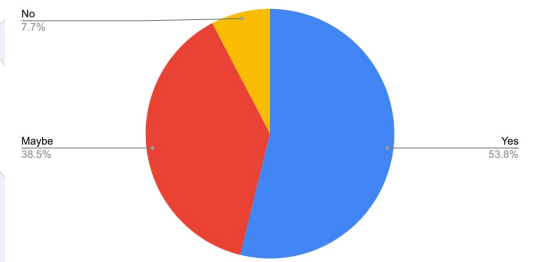
I know who to contact if I have questions about pursuing future opportunities at LANL.



I have a useful network of contacts at LANL.



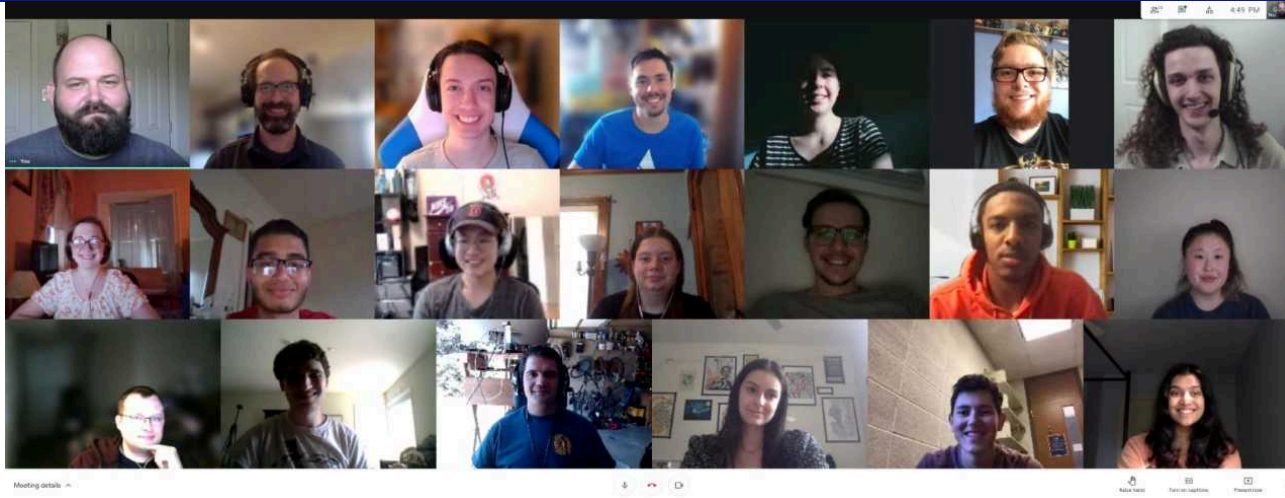
With the knowledge you've gained, are you interested in a career in HPC computing?



SI to staff conversion

	HPC Pipeline Intern	Current HPC Staff	Current LANL Staff	Previous LANL Staff	Total School Interns	% Conversion
2007	0	0	3	2	9	56%
2008	0	0	0	1	9	11%
2009	0	2	0	4	12	50%
2010	0	1	3	1	12	42%
2011	0	1	4	2	12	58%
2012	0	0	1	1	12	17%
2013	0	1	2	0	12	25%
2014	0	2	1	1	12	33%
2015	0	1	1	0	12	17%
2016	0	3	2	0	12	42%
2017	0	0	0	0	9	0%
2018	3	3	0	0	12	25%
2019	4	0	0	0	12	0%
2020	1	0	0	0	12	0%
Totals	8	14	17	12	159	27%

2021 Supercomputer Institute



Students from the 2021 Supercomputer Institute along with their boot camp instructors and TAs

The Supercomputer Institute is an 11 week fast track into the world of HPC targeted at undergraduate and recent baccalaureates.

The institute has served as a successful pipeline tool for recruiting and educating future HPC professionals.

PI: Evan Donato

Total Project Budget: \$150,000

***ISTI Focus Area: IS&T - Computing Platforms:
Architecture, Technologies, and Infrastructure***

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